

Turbo 310R

X-PLANE USER GUIDE



**This software is an artistic representation
of the subject matter.**

Any similarities to any commercial product, equipment, vehicle, device or other, present within this artistic representation does not constitute or imply an endorsement (by, or of) the manufacturer(s) and/or trademark holder(s) of that which may be deemed similar.

This software, including any and all components and content, © 2018 Military Visualizations Inc. All Rights Reserved.

No replication, reduction, reverse engineering or unauthorized addition to the software, either in whole or in part, is permitted in any form without the express written permission of Military Visualizations Inc.

By installing this software, you are hereby agreeing to the above terms and conditions. Any breach of the above EULA will result in litigation, removal of license and/or forfeiture of continued support.

Any inquiries regarding academic or other professional use of this software should be directed via e-mail to info@milviz.com.



Main Index

Introduction	1
Product Features	2
System Requirements	3
Installation Instructions	4
Uninstalling	6
Updating	6
Product Support	6
Aircraft Specifications	7
Recommended Speeds & Settings	7
Operational Limitations	8
Engine Limitations	8
Tutorial: Using the T310R Aircraft Menu	9
Tutorial: Starting the Turbo 310R	10



Welcome!

This User Guide has been prepared to help you get started with your new Turbo 310R for X-Plane.

It contains useful information about your Turbo 310R's equipment, operating procedures, and performance. It also contains instructions for installation and updating. We recommend that you take some time to read through this guide from cover to cover, and to refer to it as needed.

Our interest in your simulation activity has not ceased with your purchase of the MilViz Turbo 310R. Worldwide, the Military Visualizations staff stands ready to assist and serve. For technical

support, please post a request on our Turbo 310R X-Plane support forum. Our dedicated and talented staff is ready to help you.

For forum access please email oisin@milviz.com with your proof of purchase and your preferred or existing forum username.

Bringing the 310R to X-Plane

This isn't the first version of the 310R to wear the MilViz label. The original version of the MilViz 310R was released way back in 2010 in Microsoft Flight Simulator X, well known not only for its accurate portrayal of the iconic twin but also for the carefully tuned and realistic flight model.

In the spring of 2018 we released the 310R Redux, for FSX and Prepar3d. This version was a complete overhaul of the original, with enhanced and updated systems programming, an updated virtual cockpit, new external textures, and a brand new soundscape. In other words, pretty much everything required in order to bring this aircraft up to current standards.

In bringing the 310R into the X-Plane world, we've retained the same excellent standards that we're known for, while taking advantage of all of the modern technology available to us in X-Plane 11.

We're happy to be here, and we're very happy that you could join us. Thanks and enjoy the ride!

Product Features

> Designed for X-Plane 11

- » Optimized for X-Plane 11 engine and handling behavior
- » Inclusion of PBR materials and textures
- » Advanced FMOD sounds inside and out

> High Quality Textures & Modeling

- » Physical Based Rendering (PBR) materials and textures for superb real-time reflections and shine
- » Exterior and interior rendered with exacting detail and precision
- » High resolution, beautiful textures with realistic weathering effects
- » Smoothly animated parts inside and out

> Realistic Simulation of the Turbo 310R

- » Behavior designed to closely simulate the real world
- » Authentic turbo performance and handling
- » Realistic fuel load and tank capacities
- » Realistic weight & balance



> Advanced Autopilot System

- » Autopilot mimics real world behavior, requiring hands-on operation
- » Simulation of VOR station 'Cone of Confusion' when approaching VOR station, requiring monitoring and switching from NAV to HDG to maintain proper course
- » Servo behavior which lacks in speed and accuracy as per real world examples

> GPS Configuration Options

- » FPS friendly X-Plane GNS 530 & GNS 430 included by default
- » Includes support for RealityXP's GTN 750* & 650* integrated into the 3D cockpit

> Custom Aircraft Panel

- » In-game menu panel allows for display of ground elements, switching liveries and changing the GPS displays



System Requirements

The following requirements apply as a minimum to successfully install, configure and operate the MilViz Turbo 310R for X-Plane.

(Please that these requirements represent the minimum required; your choice of scenery, location, and simulator settings may place additional demands on your simulation platform that may ultimately affect your simulator experience.)

Supported Platforms:

X-Plane 11

Supported Operating Systems:

All operating systems which are supported by the X-Plane 11 platform. At the time of publication, this includes:

- OS X: OS X 10.10 or newer
- Windows: Windows 7, 8, or 10, 64-bit
- Linux (While any distribution which successfully runs X-Plane 11 should be capable of operating this aircraft, distribution specific issues with X-Plane 11 that may causes issues with this aircraft are not supported.)

Processor (CPU):

Intel Core i3, i5, or i7 CPU with 2 or more cores, or AMD equivalent. (Recommended: Intel Core i5 6600K at 3.5 ghz or faster.)

Video Card (GPU):

DirectX 11-capable video card from NVIDIA, AMD or Intel with at least 1 GB VRAM. (Recommended: DirectX 12-capable video card from NVIDIA, AMD or Intel with at least 4 GB VRAM, GeForce GTX 1070 or better or similar from AMD.)

System Memory (RAM):

8 GB RAM (Recommended: 16-24 GB RAM or more.)

Hard Drive:

1.5 GB or greater free hard drive space.

Gaming Controller:

Joystick, yoke, or other gaming controller (a means of controlling the aircraft rudder, either with twist joystick function or dedicated pedals, is additionally recommended).

Installation Instructions

1

Beginning Installation

After purchase, you will have been given a link or an option to download a compressed file. This compressed file contains all of the folders and files for the MilViz Turbo 310R for X-Plane.

Using a file compression utility of your choice, decompress this file to a location or folder of your choosing.

(At time of purchase, you will also have been given a product key. This key will be entered in the last step.)



2

Identifying Files to Copy

Within this newly decompressed folder, you will find a sub-folder marked with a version number containing both files and folders.

You'll know that you have identified the correct folder when it looks like the below image.

This folder is the aircraft folder that needs to be placed within the X-Plane file structure.



3

Creating a Destination Folder

In the X-Plane 11 file structure, all aircraft are placed within the 'X-Plane 11\Aircraft' folder, generally in developer specific folders. This structure helps to organize your aircraft collection.

While it is largely up to the end user on how they wish to organize their aircraft, we recommend creating a sub-folder within the 'X-Plane 11\Aircraft' folder titled 'MilViz'.



Installation Instructions (continued)

4

Copying the Aircraft

You should now have a folder structure that resembles the following:

'X-Plane 11\Aircraft\MilViz'

Copy the aircraft folder you identified in Step 2 into this newly created MilViz folder. Done correctly, it should closely resemble the following image.



5

Verify Installation

Once the aircraft folder is installed correctly, launch X-Plane 11.

On the left side of the Flight Configuration UI screen, you should be able to find your new Turbo 310R.

You may now select it and start a flight (making any other desired adjustments to starting location & weather, of course).



6

Product Key Registration

At time of purchase, you should also have been given a product key. This product key is used to register your aircraft, and is tied to your individual purchase.

On the first launch of the aircraft, a window will automatically show, asking for the product key. Enter the key you received and press the 'Register' button to continue.

Your aircraft is now ready for use!



Uninstalling

The MilViz Turbo 310R may be un-installed very simply by deleting the aircraft folder that you manually copied into the X-Plane 11 file structure.

Note: Prior to uninstalling the aircraft, please be sure to back up any customized files or custom liveries you have installed if you wish to keep them.

Updating

In the event that you are notified of an update to the MilViz Turbo 310R, it is highly recommended that you completely uninstall the previous version before you install the newly updated version. This will ensure that the correct versions of any changed files are present.

Product Support

We are deeply committed to the satisfaction of our customers. If you encounter any issues with your product or require assistance, or just have a general question, we encourage you to visit our forums at <http://milviz.com/forum/>.

Support forums for our individual products are restricted to owners of that product. To register for a specific support forum, please contact oisin@milviz.com for registration information and details. Please note that proof of purchase will be required.



Aircraft Specifications

Number of Engines	2	Maximum Takeoff Weight:	5500 lbs
Engine Model Number:	TSIO-520-BB	Maximum Landing Weight:	5400 lbs
Engine Type:	Turbocharged, fuel injected, direct drive, air-cooled, horizontally opposed, six cylinder, 520 cubic-inch displacement.	Maximum Zero Fuel Weight:	5015 lbs
Horsepower:	285 rated horsepower at 2700 RPM and 32.0 inches Hg. manifold pressure to the critical altitude of 16,000 feet.	Standard Empty Weight:	3467 lbs
Propellers:	2, 3-blade, 6' 6" diameter, constant speed, full feathering, non-reversible hydraulically actuated.	Maximum Useful Load:	2068 lbs
		Main Fuel Tanks - Usable	100 U.S. Gallons (total)
		Auxiliary Fuel Tanks - Usable	63 U.S. Gallons (total)
		Total Wing Area:	179 square feet
		Wing Loading:	30.73 lbs per square foot
		Power Loading:	9.65 lbs per horsepower

Recommended Settings & Speeds

Normal Takeoff:	2700 RPM, Full Throttle, Flaps 0°	Raise nosewheel at 80 KIAS, Lift-off at 92 KIAS (5500 lbs Max Weight)
Max Performance Takeoff:	2700 RPM, Full Throttle, Flaps 15°	Raise nosewheel at 70 KIAS, Lift-off at 82 KIAS (5500 lbs Max Weight)
Best Angle-of-Climb Speed (S.L.):		81 KIAS (at 5500 lbs Max Weight)
Best Rate-of-Climb Speed (S.L.):		105 KIAS (at 5500 lbs Max Weight)
Cruise Climb:	2350 RPM, 29 In. Hg.	115 to 140 KIAS
Maximum Climb:	2700 RPM, Full Throttle below 16,000 feet, Max allowable M.P. above 16,000 feet.	105 KIAS
Cruise:	2100 to 2350 RPM and 15.0 to 29.0 In. Hg. or 2200 to 2300 RPM and 15.0 to 30.0 In. Hg.	
Minimum Multi-Engine Approach Speed:		93 KIAS (at 5400 lbs Max Weight)

Aircraft Limitations

Operational Limitations

Maneuvering Speed VA (knots)	148 KIAS	Do not make abrupt or sudden control movements above this speed.
Maximum Flap Extended Speed VFE (Knots) 15°	158 KIAS	Do not exceed this speed at this flap setting.
Maximum Flap Extended Speed VFE (Knots) 35°	139 KIAS	Do not exceed this speed at this flap setting.
Maximum Gear Operating Speed VLO (Knots)	138 KIAS	Do not operate the landing gear above this speed.
Maximum Gear Extended Speed VLE (Knots)	138 KIAS	Do not extend the landing gear above this speed.
Air Minimum Control Speed VMCA (Knots)	80 KIAS	This is the minimum speed at which the aircraft is controllable with one engine inoperative and a 5° bank towards the operative engine
One Engine Inoperative Best Rate-of-Climb Speed Vy (Knots)	106 KIAS	The speed delivering the greatest gain in altitude in the shortest time with one engine inoperative at sea level, standard day conditions and level flight
Never Exceed Speed VNE (Knots)	223 KIAS	Do not exceed this speed in any type of operation
Maximum Cruising Speed VNO (Knots)	181 KIAS	Do not exceed this speed except in smooth air and with caution

Engine Limitations

Altitude (Feet)	Allowable Manifold Pressure (In. Hg.)	Engine RPM	Brake Horse-power
S.L. to 16,000 feet	32.0	2700	285
18,000	30.7	2700	268
20,000	29.0	2700	246
22,000	26.4	2700	222
24,000	24.3	2700	198
26,000	22.2	2700	176
28,000	20.2	2700	155
30,000	18.5	2700	136
32,000	17.0	2700	117



Tutorial: Using the T310R Aircraft Menu

The MilViz Turbo 310R includes a custom aircraft menu panel which is accessible once the aircraft is loaded. From this menu, it's possible to perform the following actions:

- Remove / Attach external features
- Change Aircraft Liveries
- Switch between GPS options

The menu panel may be opened (or closed) by utilizing the X-Plane Menu Bar located at the top of the screen, and choosing "Plugins > MilViz T310R > Show/Hide Options".

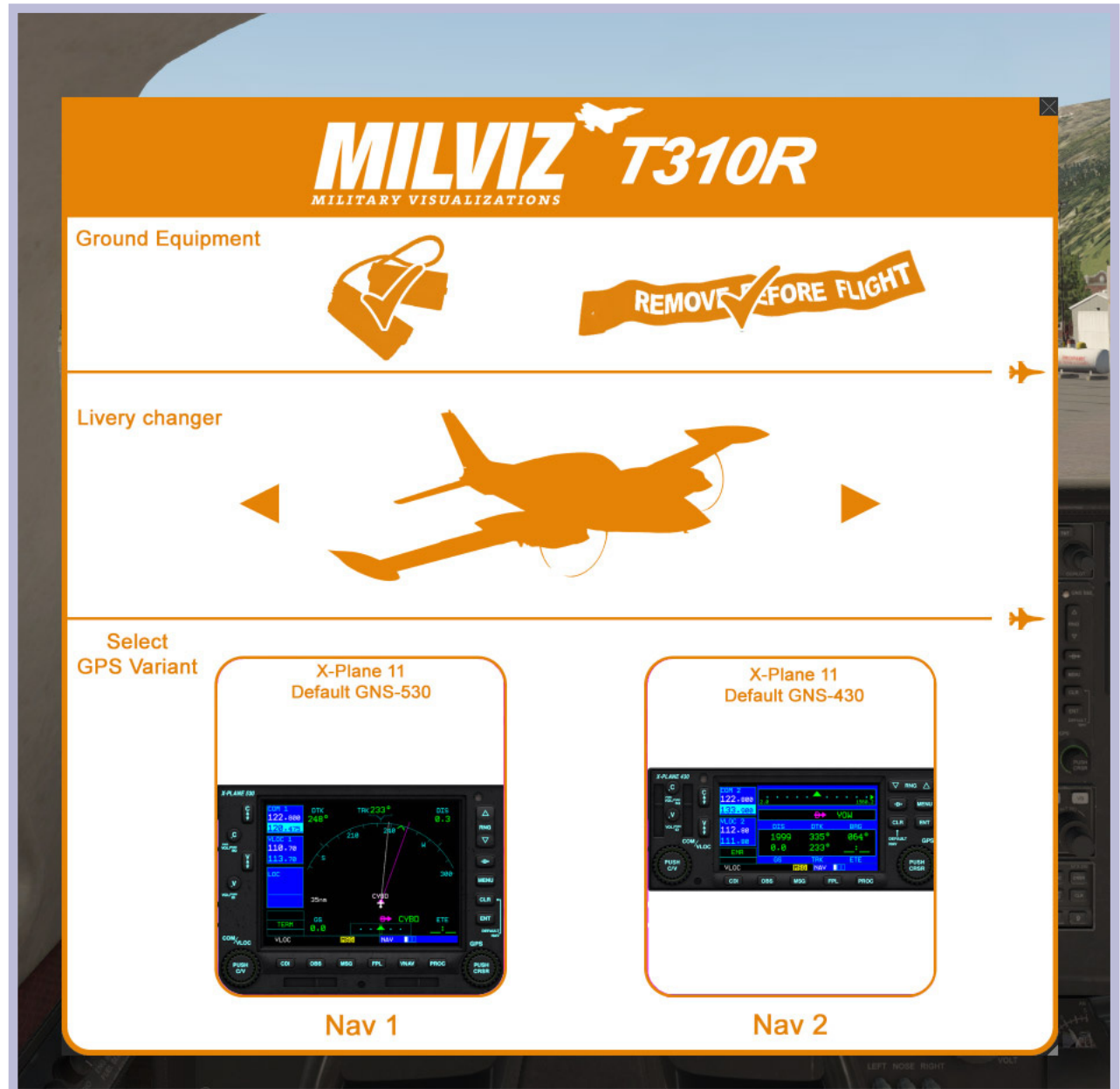
Clicking on the images of the chocks or the 'Remove Before Flight' flag allows you to hide or show those respective features on the aircraft.

The next section allows you to switch aircraft liveries on the fly by clicking the arrows to the left or right of the aircraft image.

The GPS options allow you to switch between the stock X-Plane GNS 530/430 and the RealityXP GTN 750/650 variants (not included).

To switch, click the image shown for either Nav 1 or Nav 2. The changes will immediately be reflected in the aircraft.

IMPORTANT: When transitioning between the Reality XP GTN 750 and the stock X-Plane GNS 530, be sure to turn the GTN 750 OFF in the plugins menu. This is found at 'Plugins>Reality XP GTN>GTN1'.



Tutorial: Starting the Turbo 310R

For this portion of the T310R user guide, we've elected to present a step-by-step walkthrough of how to take the Turbo 310R from a cold and dark state all the way up to being ready for taxi and takeoff.

This is provided in lieu of a pseudo-realistic series of procedural checklists which, although often containing a wealth of information of interest to those wanting to mimic the full scope of pilot activities, cover many areas not relevant to simulator use and don't always do a lot to help a newer pilot find their bearings.

The systems and engine management in the Turbo 310R is not exceedingly complex and do not need in-depth coverage in order to successfully operate the aircraft, given that there is no custom failure or wear-n-tear simulation included.

Instrumentation included in the T310R panel is fairly standard and the interpretation of such should be familiar to simulation pilots.

Failures that are a default part of the X-Plane platform are not within our scope of coverage. Such failure modes are generic to all aircraft within the

simulator and do not need to be addressed by our guide. The use of such modes is not discouraged nor recommended; it is purely left to user choice.

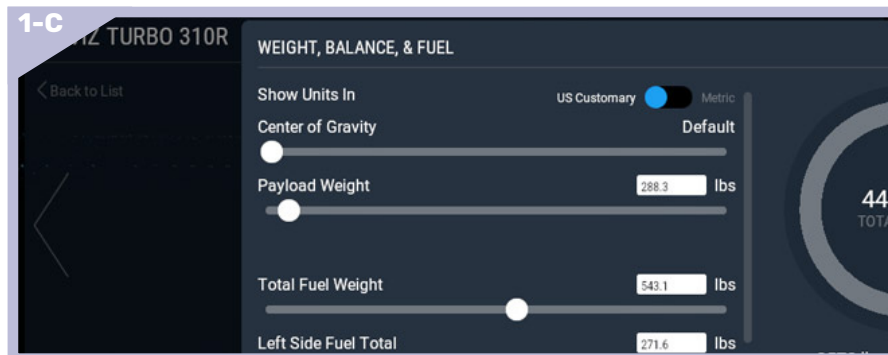
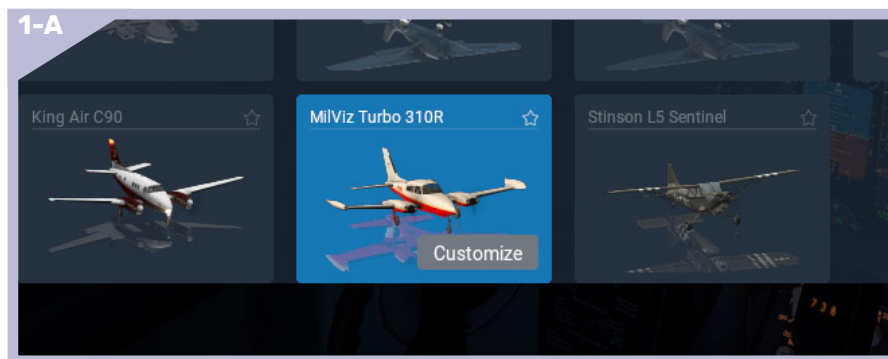
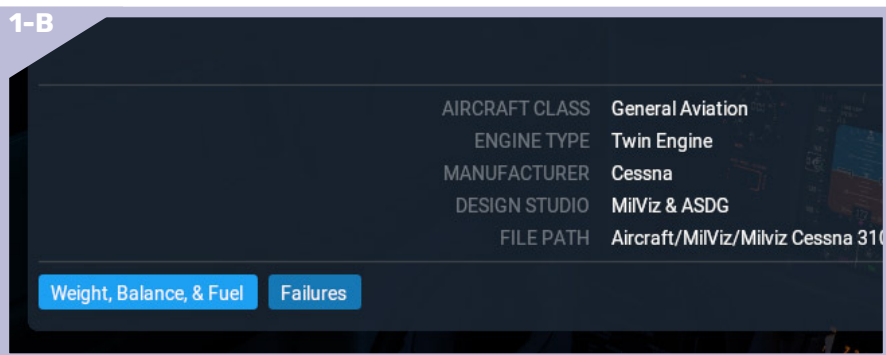
Aside from the specifications and limitations we've also listed within this user guide, our primary advice is simply to pay attention to the limitations indicated on the instrumentation, primarily the airspeed indicator, the manifold pressure gauge and the RPM gauge.

Have fun and keep the blue side up!



Preflight Actions

- 1) Adjust fuel quantities and weight as desired for flight
 - Adjustments are made through the Flight Configuration UI
 - a) When selecting the aircraft, press the “Customize” button
 - b) Next, press the “Weight, Balance & Fuel” button
 - c) Adjust as desired
 - Tanks 1 & 2 (the main tip tanks) are filled before aux tanks
 - The usable C.G. range is from -1.5” (forward) to +2.8” (aft)



- 2) Remove wheel chocks and covers
 - This action can be done through a custom menu panel
 - This panel is opened through the top UI menu bar
 - Choose “Plugins > MilViz T310R > Show/Hide Options”





Before Starting Engines

- 1) Set Parking Brake
 - Hold the left mouse button, pull the lever out to set
- 2) Switch Fuel Selectors to Main Tanks
 - Left click on the desired placard area to turn the selectors
- 3) Set Throttle, Propeller & Mixture levers
 - a) Set Mixture levers fully rich (forward)
 - b) Set Propeller levers fully forward
 - c) Set Throttle levers open approximately one inch
- 4) Turn on Battery and Alternator Switches
 - The lower switch panel is located directly below the yoke
 - For easier access, the yoke may be hidden from view
 - To hide the yoke, left click on the yoke shaft



Before Starting Engines (continued)

- 5) Set lighting switches and dials as required
 - Toggle switches ON/OFF with the left mouse button
 - Rotate dials to adjust brightness with the mouse wheel
- 6) Set Altimeter to correct barometric pressure or elevation
 - Use the adjustment knob at the bottom left of the altimeter
 - Rotate the mouse wheel when over the adjustment knob
- 7) Open left and right Cowl Flaps
 - Hold the left mouse button, pull or push control handles





Starting Engines

(left engine is started first, then right engine)

- 1) Turn on Magneto Switches
 - Toggle switches ON with the left mouse button
- 2) Start Engine
 - a) Press Start button for desired engine
 - Click the button using the left mouse button
 - b) Engage the Primer left or right, depending on engine
 - Click and hold the primer switch and drag to left or right
- 3) Turn Auxiliary Fuel Pump switch to LOW
 - Toggle switch to LOW with the left mouse button
- 4) Set Throttle lever to obtain 800 to 1000 RPM

(repeat steps 1 through 4 for right engine)



Before Taxi

- 1) Turn on Avionics Master Switch
 - Toggle switch ON with the left mouse button
- 2) Turn on and set Avionics as desired
- 3) Release Parking Brake
 - Brakes will release by pressing the toe brakes
 - Brakes may also be released by using the control handle



You're cleared for takeoff, enjoy your flight!

A detailed rendering of a twin-engine propeller aircraft, likely a Cessna 441, flying over a landscape. The aircraft is white with blue and red stripes along the fuselage and wings. The registration "N5225J" is visible on the tail. The background shows a hazy landscape with a town and a river under a blue sky with light clouds.

Credits

MilViz Team

Modeling & Textures

Testers

MILVIZ 